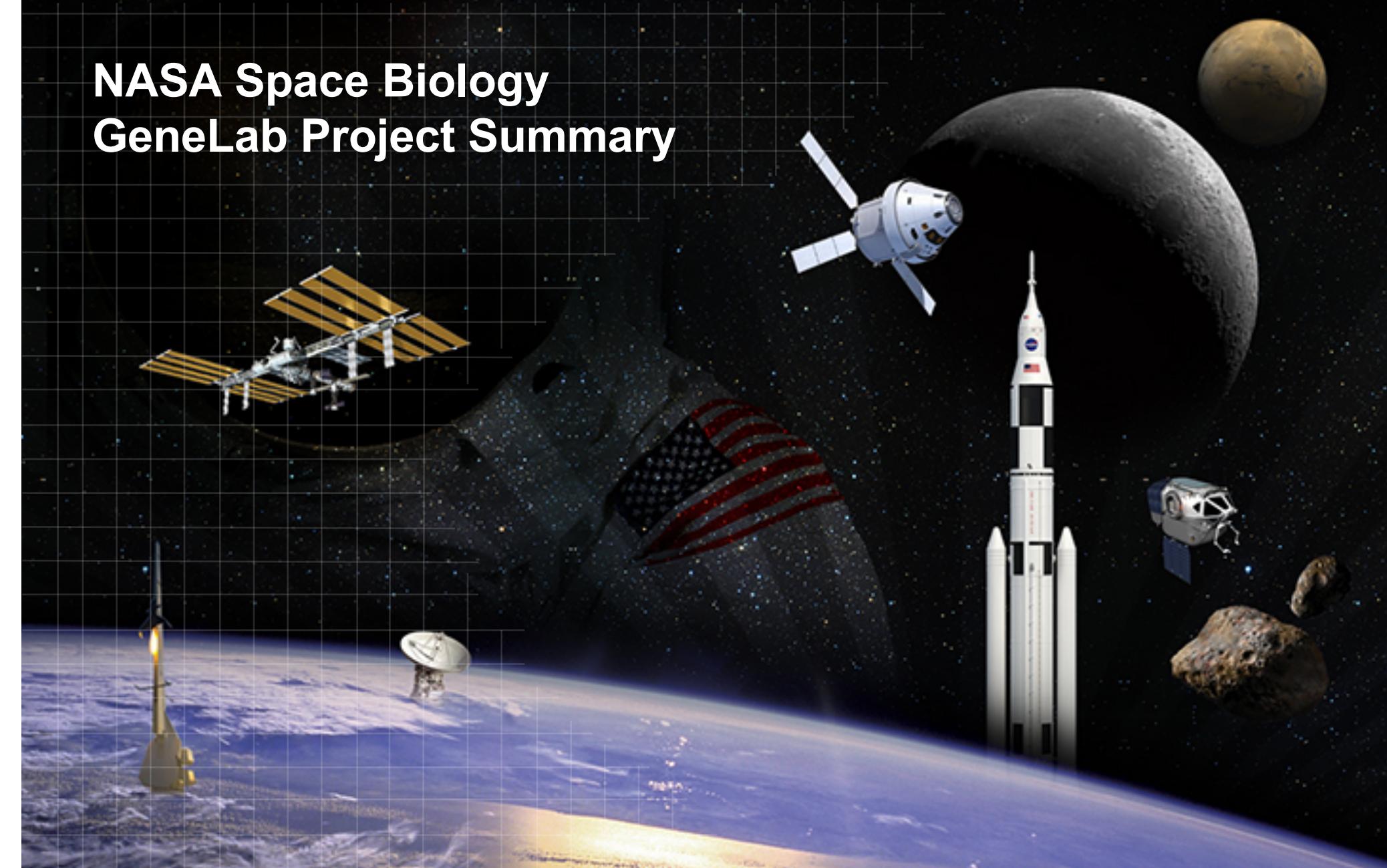




# NASA Space Biology GeneLab Project Summary



# GeneLab Project Strategic Plan



The GeneLab Strategic Plan sets four goals for the GeneLab project:

- Develop an integrated repository and bioinformatics data system for analysis and modeling
- Enable the discovery and validation of molecular networks that are influenced by space conditions through ground-based and flight research using next-generation omics technologies
- Engage the broadest possible community of researchers, industry, and the general public to foster innovation
- Strengthen international partnerships by leveraging existing capabilities and data sharing



# GeneLab Data Repository On-Line Now



GeneLab

Open Science  
for Exploration

Home Repository Data Data Mining Tools Submit Data Contact Us

<http://genelab.nasa.gov/>  
80 Studies – And Growing

Page 1 of 1 (Total Studies: 80)

Studies Per Page:



GLDS-83

## Comparative Transcriptomic Analysis of Adult Medaka Tissues Sampled after Adaptation to a Space Environment

| Organisms       | Factors     | Assay Types             | Release Date | Description   |
|-----------------|-------------|-------------------------|--------------|---|
| Oryzias latipes | Spaceflight | transcription profiling | 15-Oct-2015  | To understand how humans adapt to space environments, many experiments can be conducted on astronauts while they work aboard the Space Shuttle or the International Space Station (ISS). We also need animal experiments that can apply to human... |



GLDS-81

## Bacillus subtilis strains at low-pressure: 5 kPa versus 101 kPa growth

| Organisms         | Factors         | Assay Types             | Release Date | Description   |
|-------------------|-----------------|-------------------------|--------------|---|
| Bacillus subtilis | strain pressure | transcription profiling | 14-Mar-2014  | Comparing the transcriptional responses of Bacillus subtilis strains WN624 and WN1106 at 5 kPa and 101 kPa. WN1106 is a 5 kPa-evolved strain with increased fitness compared to ancestor-WN624 strain at 5 kPa. This experiment probed the diffe... |

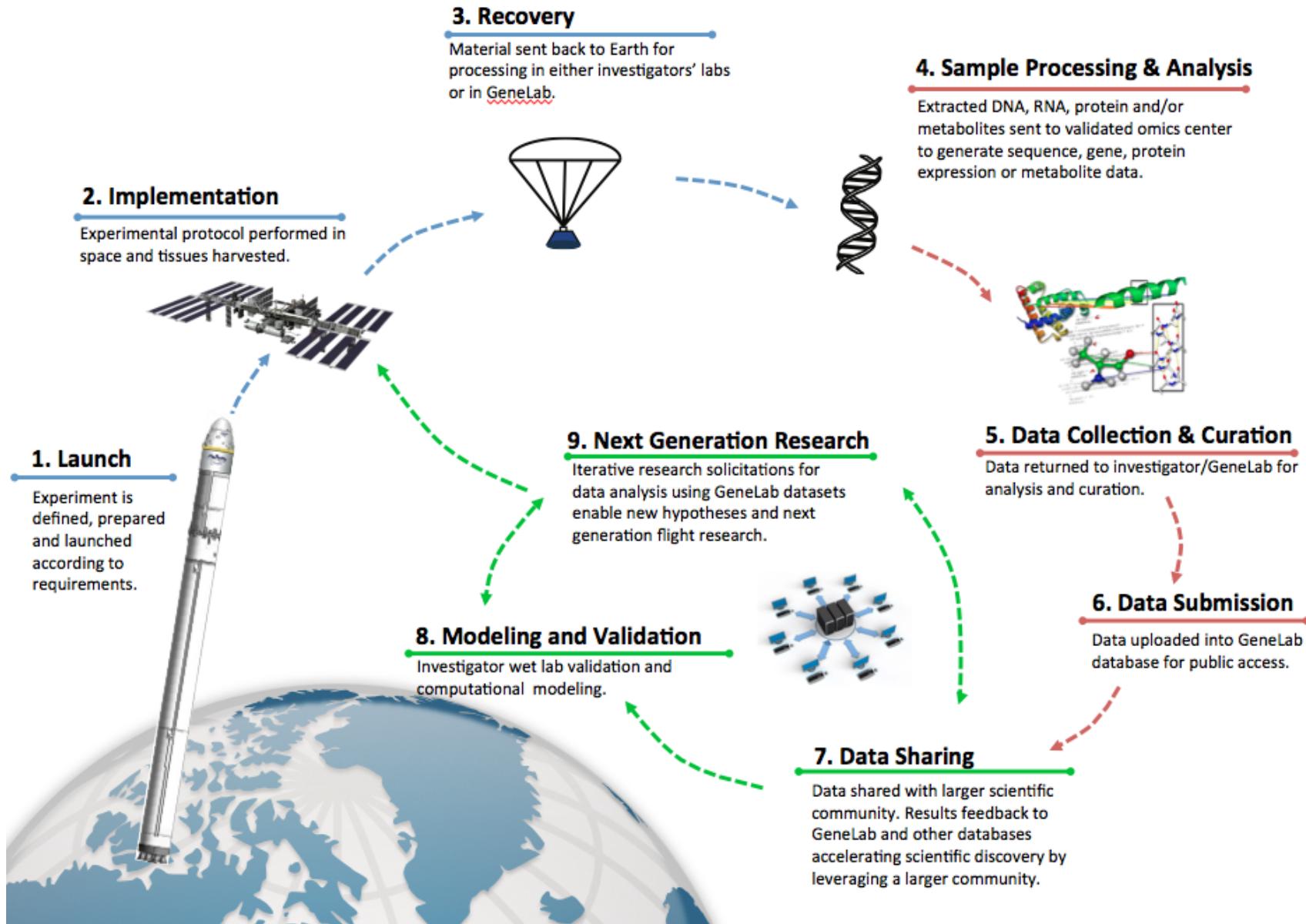


# GeneLab Project Updates

- The GeneLab Data System ([genelab.nasa.gov](http://genelab.nasa.gov)) now houses 80 datasets which are meticulously curated and fully accessible to the public: 47 of these studies are from Spaceflight experiments, and 33 from relevant ground experiments.
- GeneLab is currently averaging more than 1000 file downloads per month, with a data volume of roughly 3 terabytes per month, available worldwide.
- Newsletter updates are currently sent to 4,479 subscribers.
- GeneLab has collaborated with the following recent missions (including CASIS) to obtain either tissue samples or data for subsequent omics analyses: Rodent Research-1, Rodent Research-3, Micro-9, Micro-10, Microbial Tracking-1c, BRIC-19, BRIC-20, and the BRIC-23 Process Verification Test.
- GeneLab released an Innovation Awards Research Announcement (NRA NNH16ZTT001N-GL) in March 2016 which garnered 34 responses.



# Concept of Operations



# How to engage with GeneLab



There are two types of collaborative missions:

## **Data Sharing Missions**

In Data Sharing missions GeneLab provides a platform for investigator data, enabling PIs to easily meet the public posting requirement of the NRA. Prior to launch, GeneLab works with the PI to understand the data volume anticipated and the nature of the data to be shared. Post-flight GeneLab works closely with the PI team to facilitate the data and metadata submission.

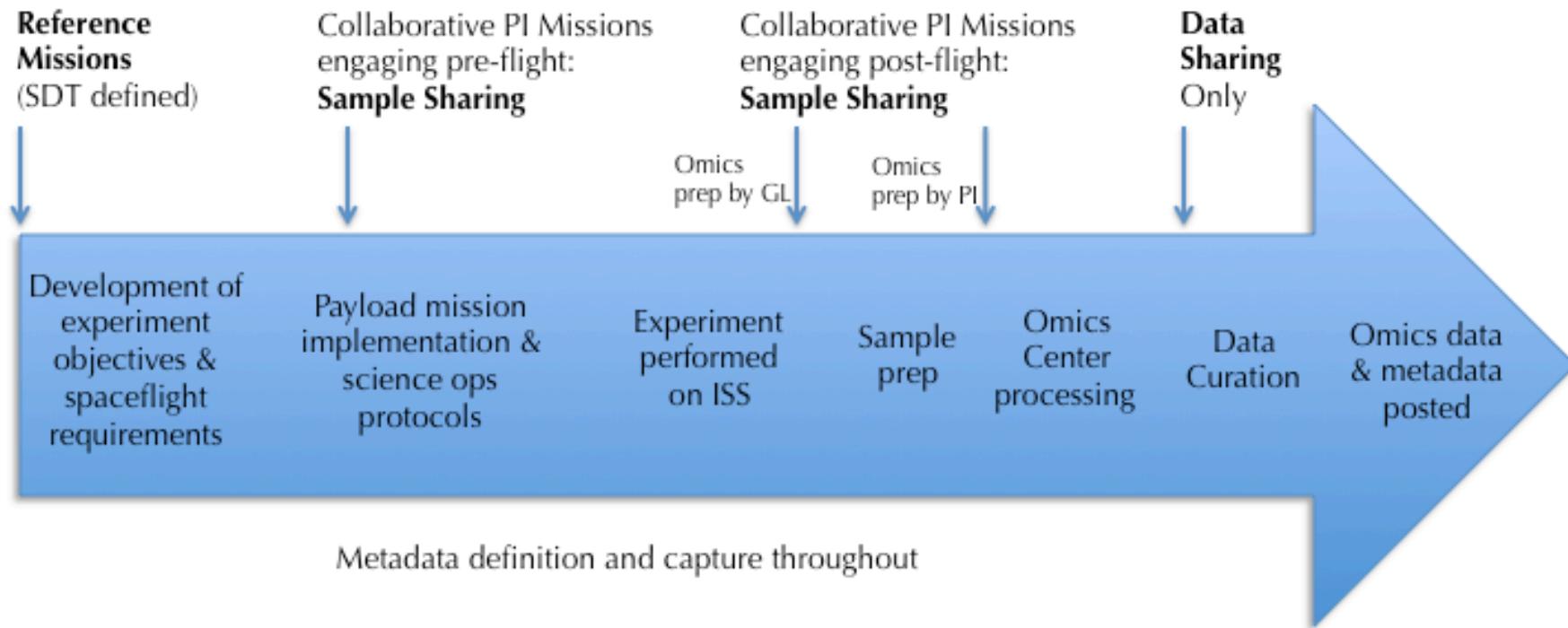
## **Sample Sharing Missions**

The goal of the Sample Sharing missions is to make the greatest use of all cells/tissues/samples that have experienced microgravity conditions. Prior to launch GeneLab engages with the PI to determine the tissues/samples that can be donated to or augmented by GeneLab for post-flight processing and immediate posting to the data system. GeneLab takes receipt of these samples either immediately post-flight, or post-PI processing depending upon the nature of the samples. GeneLab works closely with the PI team post-flight to facilitate the data and metadata submission.

# When to engage with GeneLab



The GeneLab process toward data is the same for any collaboration. The only difference is the chronological point at which GeneLab engages with the PI/experiment.



Blessed are the flexible, for they shall not be bent out of shape. — Anonymous.



# GeneLab Model Organism Interest



- Mus musculus
- Arabidopsis thaliana
- Homo sapiens
- cellular organisms
- bacterial isolates
- Brassica rapa
- Drosophila melanogaster
- Rattus norvegicus
- Bacillus
- Saccharomyces cerevisiae
- Caenorhabditis elegans
- Environmental Samples
- Aspergillus fumigatus
- Rhodospirillum rubrum
- Pseudomonas aeruginosa
- Bacillus subtilis
- Salmonella enterica
- Danio rerio
- Escherichia coli
- Candida albicans
- Ceratopteris richardii

